

## Development of the synthetic waveform database for tsunami forecasting system based on offshore data assimilation

Yutaka Hayashi<sup>1\*</sup>, Kenji Maeda<sup>1</sup>, Hiroaki Tsushima<sup>1</sup>, Hitoshi Takeuchi<sup>2</sup>, Yoichi Murashima<sup>2</sup>, Izuru Nomura<sup>2</sup>

<sup>1</sup>Meteorological Research Institute, <sup>2</sup>Kokusai Kogyo Co. Ltd.

Meteorological Research Institute (MRI) and Kokusai Kogyo Co. Ltd. produced the synthetic tsunami waveform database for tsunami forecasting system based on offshore tsunami data assimilation by July, 2012. Database is intended to be utilized as a dataset of Green's functions for the prototype system of "tsunami forecasting based on inversion for initial sea-surface height" (tFISH; Tsushima et al., 2009) developed by MRI and NEC Corporation by 2012. The database system contains of the main database, sub-databases, and data viewer software. Main database is an assembly of synthetic tsunami waveforms at each output point computed by using linear long-wave equation corresponding to each unit tsunami source. Two quake-prone areas, along Japan Trench and along Nankai Trough, are targets of the database system. Shapes of unit tsunami sources were defined by two-dimensional Gauss distribution function with a scale parameter of  $\sigma = 10, 20, \text{ or } 40\text{km}$ . Total 3345 unit tsunami sources were arranged at regular intervals in two target areas. Total 664 output points near both target areas were selected from the location of offshore observatories and forecast points, which were virtual offshore observatory used for tsunami forecasting. In addition, sea-level data at grid points arranged at regular intervals were saved, so that synthetic tsunami waveforms at any location, where sensors are installed in a future, can be generated by interpolation. Total number of jobs to compute all synthetic tsunami waveforms was 46712. In order to check these enormous computing results, automatic quality control subroutines were developed and added in. Sub-databases will be prepared by extracting from the main database, so that they are consistent to parameters engaged in inversion process of the tFISH system. In addition, data viewer software was developed for conveniences of checking by visualizing these computing results.

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